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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,062	12/12/2003	H. Dennis Argo	16263BAUS01U	4249
34645 7590 01/02/2009 Anderson Gorecki & Manaras, LLP Attn: John C. Gorecki P.O BOX 553 CARLISLE, MA 01741			EXAMINER HOANG, HIEU T	
			ART UNIT 2452	PAPER NUMBER
			NOTIFICATION DATE 01/02/2009	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/736,062

**Applicant(s)**

ARGO, H. DENNIS

**Examiner**

HIEU T. HOANG

**Art Unit**

2452

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 October 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 21-40 is/are pending in the application.  
4a) Of the above claim(s) 39 and 40 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 21-38 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/CD/CD)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/27/2008 has been entered.
2. Claims 1-20 are cancelled.
3. Claims 21-40 are new and pending.
4. Claims 39-40 are restricted by election/restriction by original presentation (see below)
5. Claims 21-38 are presented for examination.

### ***Response to Arguments***

6. Applicant's arguments have been fully considered but are moot in view of new ground(s) of rejection.

### ***Election/Restrictions***

7. Newly submitted claims 39-40 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claims 39-40 are related to a distinct embodiment wherein assignment of VPN tunnel to a special

processing unit is based on tunnel type; whereas claims 21-38 are related to assignment based on available resources (such as bandwidth)

8. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 39-40 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 21-38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Consider claim 21, line 9 recites "the current available bandwidths", which lacks antecedent basis. "Decrementing the initial expected available bandwidth" on line 11 should be "decrementing ...". "The highest current available bandwidth" on line 13 is vague for having no connection to estimating the current available bandwidths. "The absolute bandwidth" on line 14, "the largest amount" on line 15 lack antecedent basis. For claim 30, the claim recites similar errors. Furthermore, reciting "SPU" and "capacity" is vague.

11. Correction is required to fix similar errors in all pending claims.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (Flexible control of a parallelism in a multiprocessor PC router, hereafter Chen) and further in view of applicant's admitted prior art (Background of the application, hereafter AAPA), and Venkatanarayan et al. (US 2005/0044221, hereafter Venkatanarayan) and Gourlay (US 6,820,123)

14. For claim 21, Chen discloses a method of allocating processing capacity of system processing units in an extranet gateway, the method comprising the steps of:  
establishing a first initial expected available bandwidth of a first of the system processing units; establishing a second initial expected available bandwidth of a second of the system processing units (abstract, par. 2, different CPUs have their own processing speeds that is related to their throughput or bandwidth, 5.2, par. 2, e.g. a CPU can forward 239,234 packets per second); and

Chen does not explicitly disclose assigning a Virtual Private Network (VPN) tunnel to one of the first and second system processing units for processing.

However, AAPA discloses the same (AAPA, [0010], assigning tunnels to processing units)

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Chen and AAPA to apply bandwidth calculation of Chen to efficiently assigning VPN tunnels by making use of CPU speed and bandwidth relation.

Chen-AAPA does not disclose by according to estimated current available bandwidths of the first and second system processing units; wherein the highest current available bandwidth is based on an absolute bandwidth capacity basis, the absolute bandwidth being calculated by determining which system processing unit has the largest amount of estimated current available bandwidth.

However, Venkatanarayan discloses by assessing current available bandwidths of the first and second system processing units (fig. 1, abstract, [0015], lines 15-25, load balancing across active adaptors by selecting an adaptor (processing units) with the most available bandwidth),

wherein the highest current available bandwidth is based on an absolute bandwidth capacity basis, the absolute bandwidth being calculated by determining which system processing unit has the largest amount of estimated current available bandwidth (fig. 1, abstract, [0015], lines 15-25, load balancing based on selecting a processing unit with the most available bandwidth).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Chen and AAPA and Venkatanarayan to load balance VPN tunnels to the processor that has the most available bandwidth to maximize throughput and avoid congestion.

Chen-AAPA-Venkatanarayan does not explicitly disclose the current available bandwidths being estimated by assessing the initial expected available bandwidths for each system processing unit and decrementing the initial expected available bandwidth of each system processing unit by other processing requirements assigned to that respective system processing unit.

However, Gourlay discloses the same (fig. 1, steps 100-104, col. 3 lines 5-11, available throughput is total throughput subtracted by current utilized throughput)

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Chen, AAPA, Venkatanarayan and Gourlay to load balance VPN tunnels to processors that has the most available resources to fully utilize the processing capability of the processors and therefore raise throughput level of VPN gateway.

15. Claims 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen, AAPA, Venkatanarayan, Gourlay, and Diamant (US 7,082,530)

16. For claim 22, Chen-AAPA-Venkatanarayan-Gourlay does not disclose the first initial expected available bandwidth is established by determining whether the first SPU is an accelerator or a CPU.

However, Diamant discloses determining whether a processor is an accelerator or a CPU (fig. 4, steps 300-306, col. 6 line 56, determining whether an adaptor supports special processing such as IPSec)

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Chen-AAPA-Venkatanarayan-Gourlay and Diamant to distribute or balance tasks such as assigning VPN tunnels to processors that are capable of special processing when required to increase processing speed.

17. For claim 23, Chen-AAPA-Venkatanarayan-Gourlay-Diamant further discloses if the first system processing unit is an accelerator, the step of establishing the first initial expected available bandwidth comprises determining a type of accelerator (Diamant, fig. 4, step 300, 314, supporting IPSec?) and obtaining expected available bandwidth information for that type of accelerator from an initial expected bandwidth table (Chen, abstract, par. 2, 5.2, par. 2, initial expected bandwidth).

18. For claim 24, Chen-AAPA-Venkatanarayan-Gourlay-Diamant further discloses if the first system processing unit is a CPU, the step of establishing the first initial expected available bandwidth comprises determining a type of CPU and CPU speed (5.1 par. 2, CPU speed and type), obtaining a first conversion factor for the type of CPU,



and multiplying the conversion factor with the CPU speed (Chen, table 1 on p. 7, 5.2 par. 2, each CPU can forward 239,234 packets/s, 2 CPU router can forward 478,468 packets/s).

19. For claim 25, Chen-AAPA-Venkatanarayan-Gourlay-Diamant further discloses the first conversion factor is based on an amount of bandwidth passable by that processor type per unit CPU speed (Chen, table 1 on p. 7, 5.2 par. 2, each CPU can forward 239,234 packets/s).

20. Claims 26, 27, 29, 30, 35, 36, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen, AAPA, Venkatanarayan, Gourlay and what was known in the art (Official Notice or ON).

21. For claim 30, Chen discloses a method of allocating processing capacity of system processing units in an extranet gateway, the method comprising the steps of:  
establishing a first initial expected available bandwidth of a first of the system processing units; establishing a second initial expected available bandwidth of a second of the system processing units (abstract, par. 2, different CPUs have their own processing speeds that is related to their throughput or bandwidth, 5.2, par. 2, e.g. a CPU can forward 239,234 packets per second); and

Chen does not explicitly disclose assigning a Virtual Private Network (VPN) tunnel to one of the first and second system processing units for processing.

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Chen and AAPA to apply bandwidth calculation of Chen to efficiently assigning VPN tunnels by making use of CPU speed and bandwidth relation.

However, AAPA discloses the same (AAPA, [0010], assigning tunnels to processing units)

Chen-AAPA does not disclose by according to estimated current available bandwidths of the first and second system processing units; wherein the highest current available bandwidth is based on an absolute bandwidth capacity basis, the absolute bandwidth being calculated by determining which system processing unit has the largest amount of estimated current available bandwidth.

However, Venkatanarayan discloses by assessing current available bandwidths of the first and second system processing units (fig. 1, abstract, [0015], lines 15-25, load balancing across active adaptors by selecting an adaptor (processing units) with the most available bandwidth),

wherein the highest current available bandwidth is based on an absolute bandwidth capacity basis, the absolute bandwidth being calculated by determining which system processing unit has the largest amount of estimated current available bandwidth (fig. 1, abstract, [0015], lines 15-25, load balancing based on selecting a processing unit with the most available bandwidth).

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Chen and AAPA and Venkatanarayan to load balance VPN

tunnels to the processor that has the most available bandwidth to maximize throughput and avoid congestion.

Chen-AAPA-Venkatanarayan does not explicitly disclose the current available bandwidths being estimated by assessing the initial expected available bandwidths for each system processing unit and decrementing the initial expected available bandwidth of each system processing unit by other processing requirements assigned to that respective system processing unit.

However, Gourlay discloses the same (fig. 1, step 100-104, col. 3 lines 5-11, available throughput is total throughput subtracted by current utilized throughput)

Chen-AAPA-Venkatanarayan-Gourlay does not disclose the highest current available bandwidth is based on a relative bandwidth capacity basis by determining which SPU has the highest percentage of available capacity.

However, Official notice is taken that load balancing techniques based on either highest available capacity or percentage of available capacity are well known in the art at the time of the invention (see e.g. Anbiah et al., US 6,690,671, col. 4 last par.).

Therefore, it would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Chen, AAPA, Venkatanarayan, Gourlay and ON to load balance VPN tunnels to processors that has the most percentage of available resources to fully utilize the processing capability of the processors and therefore raise throughput level of VPN gateway.

22. For claim 26, Chen-AAPA-Venkatanarayan-Gourlay further discloses the other processing requirements of a system processing unit comprise processing requirements associated with other VPN tunnels already assigned to that system processing unit (AAPA, fig. 1, abstract, [0015], lines 15-25, load balancing across active adaptors by selecting an adaptor (processing units) with the most available bandwidth, AAPA, [0010], excluded assigned bandwidth to current tunnels).

Chen-AAPA-Venkatanarayan-Gourlay does not disclose overhead processing requirements assigned to that SPU.

Official Notice is taken that estimating available bandwidth taken overhead into account is well-known in the art the time of the invention.

It would have been obvious for one skilled in the art at the time of the invention to apply what was known in the art to load balancing VPN traffic to processors described by Chen-AAPA-Venkatanarayan-Gourlay to compensate for protocol overhead while calculating available bandwidth at each processor, therefore produce more realistic available bandwidth values.

23. For claim 27, Chen-AAPA-Venkatanarayan-Gourlay-ON further discloses the processing requirements associated with other VPN tunnels assigned to that system processing unit comprise encryption and de-encryption processing requirements for the other VPN tunnels (Chen, p. 9, left col., par. 2, 6.1-6.3, each VPN tunnel has associated encryption and decryption processing requirement).

24. For claim 29, Chen-AAPA-Venkatanarayan-Gourlay-ON further discloses the actual load on the other VPN tunnels assigned to the system processing unit is not monitored or used in connection with estimating the current available bandwidth of the SPU (AAPA, col. 2 lines 1-2, load balancing not taken load into account).

25. Claims 35, 36, 38 are rejected for the same rationale given in claims 26, 27, 29 respectively.

26. Claims 28, 31-34 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen, AAPA, Venkatanarayan, Gourlay, ON and Diamant (US 7,082,530)

27. For claim 28, Chen-AAPA-Venkatanarayan-Gourlay-ON does not disclose the other processing requirements of a system processing unit further comprise processing requirements associated with other VPN tunnels assigned to other system processing units.

However, Diamant discloses an adaptive load balancing technique that enables a fault tolerant mode wherein tasks on a current processor are distributed to other processors (col. 6 lines 44-53, dedicated interfaces or processors).

It would have been obvious for one skilled in the art at the time of the invention to assign dedicated processors processing power of task related to other processors so that tasks can be reassigned when failure of a processor happens.

28. Claim 37 is rejected for the same rationale given in claim 28.

29. For claim 31, Chen-AAPA-Venkatanarayan-Gourlay-ON does not disclose the first initial expected available bandwidth is established by determining whether the first SPU is an accelerator or a CPU.

However, Diamant discloses determining whether a processor is an accelerator or a CPU (fig. 4, steps 300-306, col. 6 line 56, determining whether an adaptor supports special processing such as IPSec)

It would have been obvious for one skilled in the art at the time of the invention to combine the teachings of Chen-AAPA-Venkatanarayan-Gourlay-ON and Diamant to distribute or balance tasks such as assigning VPN tunnels to processors that are capable of special processing when required to increase processing speed.

30. For claim 32, Chen-AAPA-Venkatanarayan-Gourlay-ON-Diamant further discloses if the first system processing unit is an accelerator, the step of establishing the first initial expected available bandwidth comprises determining a type of accelerator (Diamant, fig. 4, step 300, 314, supporting IPSec?) and obtaining expected available bandwidth information for that type of accelerator from an initial expected bandwidth table (Chen, abstract, par. 2, 5.2, par. 2, initial expected bandwidth).

31. For claim 33, Chen-AAPA-Venkatanarayan-Gourlay-ON-Diamant further discloses if the first system processing unit is a CPU, the step of establishing the first initial expected available bandwidth comprises determining a type of CPU and CPU speed (Chen, 5.1 par. 2, CPU speed and type), obtaining a first conversion factor for the type of CPU, and multiplying the conversion factor with the CPU speed (Chen, table 1 on p. 7, 5.2 par. 2, each CPU can forward 239,234 packets/s, 2 CPU router can forward 478,468 packets/s).

32. For claim 34, Chen-AAPA-Venkatanarayan-Gourlay-ON-Diamant further discloses the first conversion factor is based on an amount of bandwidth passable by that processor type per unit CPU speed (Chen, table 1 on p. 7, 5.2 par. 2, each CPU can forward 239,234 packets/s).

### ***Conclusion***

33. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is included in form PTO 392.

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hieu T. Hoang whose telephone number is 571-270-1253. The examiner can normally be reached on Monday-Thursday, 8 a.m.-5 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on 571-272-3964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HH

/Kenny S Lin/  
Primary Examiner, Art Unit 2452